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Comparison of three neonatal pain scales during minor painful procedures.

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OBJECTIVE: There is no single or widely accepted method to define pain in neonates. The aim of this study was to compare three different neonatal pain scales in the estimation of the pain response to minor painful stimuli in healthy term neonates. METHOD: Thirty healthy neonates were included in the study. Video recordings of infants during heel prick blood sampling were evaluated by two observers according to the Neonatal Infant Pain Scale (NIPS), the Neonatal Facial Coding System (NFCS), and the Douleur Aiguë du Nouveau-né (DAN). Crying times of infants were recorded, and the correlation between the three pain scales and crying time was calculated. The pain scores and inter-observer variability were analyzed. RESULTS: The highest correlation between the crying time and each of the three different neonatal pain scales was found for NIPS ($r = 0.74$, $p<0.001$), while similar results were found for the DAN scale ($r = 0.67$, $p <0.001$) and the NFCS ($r = 0.67$, $p<0.001$). Inter-observer variability was similar for the three scales (NFCS $r = 0.95$; DAN $r = 0.97$; NIPS $r = 0.96$). NFCS had a coefficient of variation (CV) of 59.8 +/- 32.2%. The DAN scale and NIPS had similar CV values (41.5 +/- 26.1% and 43.2 +/- 31.6%, respectively), but these values were significantly lower than that of NFCS. CONCLUSION: All three scales provided comparable results, with a slight difference favoring NIPS. Therefore, NIPS can be used to evaluate pain during minor painful procedures in neonates.

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